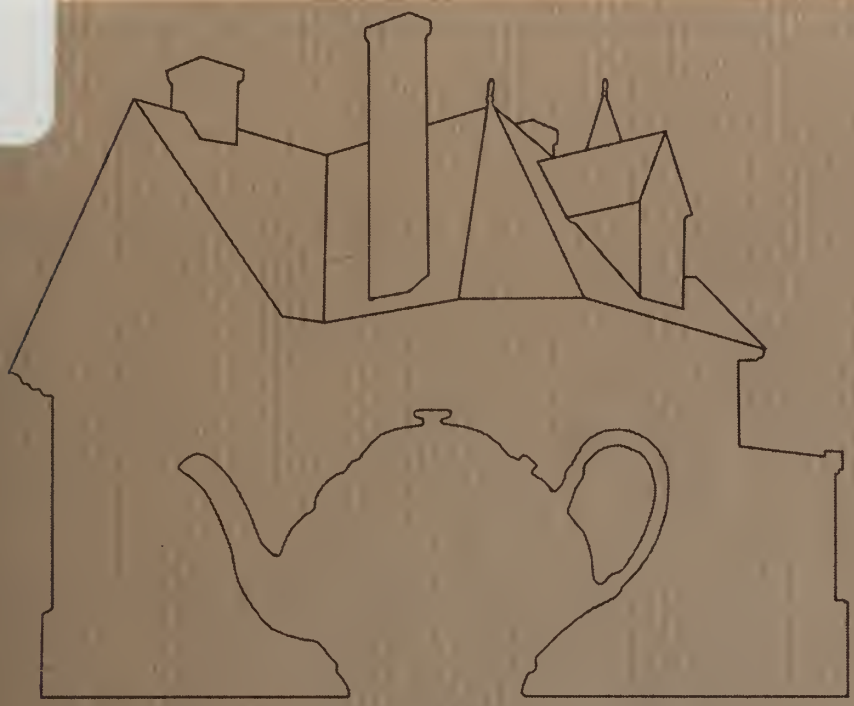

CARE OF COLLECTIONS IN HISTORIC BUILDINGS

Montana Historical Society

CARE OF COLLECTIONS IN HISTORIC BUILDINGS

compiled by the Museum Staff,
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Montana Historical Society
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COLLECTIONS CARE: WHAT IS IT?

Collections care is a primary function of all museums, including historic sites. History collections are diverse in character, sometimes bulky and unwieldy to store and exhibit, and often are housed in historic structures which themselves are deserving of care.

This manual provides suggestions and guidelines for the care of history collections in historic structures. It is based on the results of an Institute of Museum Services Conservation Project grant to survey collections and environmental conditions at the Original Governor's Mansion in Helena, as well as on current conservation literature. Collections care can be expensive and may seem to be beyond the financial and technical means of smaller institutions. Yet all museums and historical organizations with collections, large and small, face similar problems and can address them with inexpensive materials, simple procedures, and volunteer assistance.

The American Association of Museums has identified four levels of collections care:

> The first level treats collections as a whole to maintain them in an unchanging state by providing controlled environments and adequate housing for the objects. . . The second level is object preservation, which has as its primary goal the prevention and retardation of further deterioration or damage to the object. The third level is actual conservation restoration: action taken to return a deteriorated or damaged artifact as nearly as is feasible to its original form, design, color and function. The fourth level is in-depth scientific research and technical examination of the object.
>
> (American Association of Museums, *Caring for Collections,* p. 11)

In a similar manner, James Marston Fitch, writing about historic structures, defined preservation as "the maintenance of the artifact in the

same physical condition as when it was received by the curatorial agency;'' restoration as the return of a building to a particular time, usually a ''golden period;'' and conservation as ''physical intervention in the actual fabric of the building to ensure its continued structural integrity.'' (James Marston Fitch, *Historic Preservation: Curatorial Management of the Built World,* pp. 84-105)

From this discussion, the difference between maintenance, preservation, and conservation and restoration is clear.

Collections care is not just a matter of expensive conservation treatments, it is also the way we treat our collections on a daily basis. Maintenance and preservation techniques can and should be implemented by every museum, regardless of size, in order to fulfill our obligation to preserve artifacts for future generations.

When collections are exhibited and stored in historic structures, rules of collection care extend to the largest artifact in the collection-the building itself. Maintenance and preservation are necessary for the building, although techniques will differ from those used for collections. Often, a historical organization will have to consider how best to combine the needs of the collection with the needs of the building and its historical integrity.

The manual does not contain all the answers. For assistance with particular or major problems, you should feel free to call upon the staffs of other institutions, such as:

Montana Historical Society
225 North Roberts
Helena, Montana 59620 (406) 444-2694

State Historic Preservation Office
102 Broadway
Helena, Montana 59601 (406) 444-7715

Rocky Mountain Regional Conservation Center
2420 South University
University of Denver
Denver, Colorado 80208 (303) 733-2712

DOCUMENTATION

Good collections care depends on documentation. An object's historical significance is an important part of its value: it is as important to preserve the object's history as it is to preserve the object itself. Record-keeping begins with routine registration and cataloguing procedures when the object is added to the collection. *Museum Registration Methods,* (Dorothy H. Dudley et al.), published by the American Association of Museums, is a standard guide book, helpful in setting up the registration or accession record. The accession record should include a written description of the object, the material from which it is made, its maker, original use and owner, donor or means of acquisition by the museum, and any other information known about it. It is also important to remember that in marking the object with its accession number, standard museum procedures, reversible and safe for the object, should be followed. Any method of marking that may permanently mar the object, such as markers, adhesive tape, pins, staples, paper clips, or the practice of punching holes in objects to tie identifying tags in place, should be avoided. Again, books such as *Museum Registration Methods* may serve as guides to safe and accepted procedures.

Beyond the accession record it is important to keep a record of each object's condition and location, and to update this record whenever the condition changes or the object is moved. Any repairs or conservation treatments should be noted on the condition record, for this too becomes a part of the object's history. Such a record also helps in scheduling routine maintenance. Recording any damage or signs of deterioration as they occur or are noticed serves as an important guide for future repair and conservation of the object. In short, any plan to improve collections care should include a complete inventory of the collection and a detailed condition record for each object.

On historic house sites, the building itself is the most important artifact, and its condition too should be carefully noted and recorded. Regular inspection will reveal conditions or problems in the structure that require action both to preserve the building fabric and to provide the best housing for collections. It is important to keep complete records of inspections and actions taken, as a record of what has been done to the building and as a guide for future work. All changes made, such as repairs to and replacements of plumbing, wiring, windows, woodwork, or any other part of the house, and even repainting or repapering, should be fully documented, both in written records and in photographs. Samples of wallpaper, paint, old wiring, woodwork, or other materials found or removed during such work should be saved and carefully labeled with the original location and date removed. Such items are material evidence of the building's history and may be important to future restoration work.

A building operations manual can organize information to guide staff members in providing proper everyday care for the building and its collections. The manual should include information on the operation of heating and cooling systems, fire and security systems, and routine building and collections maintenance procedures and schedules. The manual should also contain information on the "attached" collections-paints, wallpapers, and carpets, as well as instructions to staff on such subjects as public access and interpretive programs, emergency procedures, and particular objects or parts of the building that pose special problems or require special care. Such a manual can help the staff keep track of their duties and also serve as an orientation document for new employees. A building operations manual will be particularly valuable when used in conjunction with a catalogue of the museum's collections and a guide (such as this one) on the care of collections.

ENVIRONMENT

The quality of the environment surrounding a collection is crucial to the collection's physical condition. While an optimal environment (one that is free of dust and dirt, and within acceptable ranges of light, relative humidity and temperature) cannot cure an object's problems, it can aid in the stabilization and preservation of an object, ensuring that the object undergoes no further deterioration.

Cleanliness is the starting point for a good museum environment. Exhibit and storage areas must be free of food, drink, dirt and dust. A

clean house will reduce the chance of infestation by insects or rodents, but regular inspection and pest control in the "support" areas of your building are a good idea. Pesticides, as well as pests, can cause damage. Collections should be protected from contact with cleaning agents and pest control sprays. Staff members can isolate insect problems by inspecting an object for signs of infestation before placing it in a collections area.

Light levels in exhibition and storage areas should be closely monitored. Today we are accustomed to much higher levels of lighting than were common in the past. In the interest of historical accuracy in a period setting, the softer, less brilliant light levels of the past should be maintained as best suits the restoration period or exhibition subject. In the interest of collections preservation, reduce all light levels and keep all lights off when rooms are not in use. Uncontrolled, high light levels will cause wood to bleach and textiles, paper, and paintings to fade and become brittle. A photographer's light meter can help you determine light levels. With the meter set for a film speed of ASA 400 and a shutter speed set at 1/50 of a second, the f-stops can be converted to footcandles as below:

f/1 = 3 fc.	f/2.8 = 25 fc.
f/1.4 = 6 fc.	f/4 = 50 fc.
f/2 = 12 fc.	f/5.6 = 100fc.

In areas containing light-sensitive objects (wood, textiles, paper, organic materials), lighting should be between 5 and 8 footcandles. Sturdier objects can be exposed to 10 to 15 footcandles; stone and metal can receive 20 to 30 footcandles of light (Per E. Guldbeck and A. Bruce MacLeish, *The Care of Antiques and Historical Collections,* pp. 30-31).

While all light damages collections, ultraviolet light rays in natural and fluorescent lighting are the most harmful. Fluorescent light tubes can be covered with special plastic filters which cut out UV rays. The same type of filters are available in sheets of plastic film or plexiglas for installation on windows. Window shades and blinds, the historical method of controlling light levels and sun damage, are also effective, although they will not by themselves remove all of the damaging effects of sunlight. Untraviolet light meters are very expensive; however, another museum or conservation lab may lend one out so that others can measure the UV levels at their site. In the meantime, it is safe to assume that any natural or fluorescent light contains an unacceptably high level of UV light. The natural light problem is accentuated at higher elevations such as we have here in the Rocky Mountain region, where there is less shielding from the atmosphere, thus more untraviolet light.

Temperature and relative humidity are also crucial in the museum environment. Hygroscopic, or absorbant, materials (wood, paper, textiles) expand and contract as humidity increases and decreases in association with changes in temperature. Rapid fluctuations in temperature and humidity over an extended period of time can cause wood to crack, veneer to pop loose, and paper and textiles to sag or tear. Not even ceramics or metals are immune to problems in such cases. In Montana, artifacts that have been exposed to extremes of hot and cold and to low humidity for many years may have adjusted to the climate, but this does not mean that they will remain stable if placed in an uncontrolled environment. All artifacts will be better preserved in a climate with very little fluctuation in temperature and humidity. Ideal levels are 68 - 70 for temperature and 40 - 45% for relative humidity (Many museum writings recommend a relative humidity of 50 - 55%, but this is unrealistic for Montana's dry climate).

Temperature and humidity are best controlled by a central heat/air conditioning system that can be closely regulated. However, careful monitoring and the use of humidifiers may be a more realistic and affordable solution for most historic sites. A recording hygrothermograph will track temperature and humidity over a weekly or monthly period. For proper use, the hygrothermograph should be regularly calibrated using readings taken from a sling pychrometer, or the more expensive, aspirating psychrometer, which will provide accurate readings of current temperature and humidity. A less expensive, but acceptable practice, is to monitor the environment with a good thermometer and hygrometer, and regularly record the readings. This information is necessary if staff is to properly adjust the heat or air conditioning system. Most historic buildings in Montana need one or more humidifiers, especially in the winter. These can be supplemented with trays of water carefully set in unobtrusive locations within room settings. Both humidifiers and trays will require daily attention.

Given Montana's long and cold winters, keeping the museum building warm must be a major priority. However, it is also very expensive. If heating costs force you to cut back the temperature in the winter, do so *very* gradually over a period of weeks. Cover collections while the building is closed down. Then, in the spring, raise the temperature in the same way. At all costs, avoid the abrupt shut-off of heat at the end of the season, or the daily routine of turning off the heat at night and turning it back the next morning.

When considering environmental questions, the historic house museum poses a double set of problems: the building itself must be preserved as a valuable historic artifact while at the same time it must provide a safe and stable environment for museum collections. To some extent, both objectives share certain requirements. For example,

whether considered as artifact or as housing for collections, the building must be watertight. Leaking roofs must be repaired; missing or rotted window frames repaired or replaced; windows sealed (to reduce temperature fluctuations and to keep out dust and insects as well as moisture); and basements or foundations sealed and waterproofed. Grading may be necessary to remove groundwater from around foundations. In any case, care must be taken to provide proper site and roof drainage and to prevent water from splashing against walls, porches, or foundation. Drainage should be directed away from the building. Given Montana's heavy snows and sudden Chinooks, snow accumulation on roofs and melting runoff can become serious problems. Gutters can freeze and clog with ice, adding to the problems — especially if the ice builds up to the point that its weight tears the gutter from the roof. The use of heat tape can relieve the problem, but remember to consult an expert and develop a plan suited to the particular building. Again, the State Historic Preservation Office is the place to begin; staff will be able to recommend consultants and suggest possible methods for dealing with these problems.

In areas of the state where earthquake damage is a threat, it is important to be aware of how earthquakes, mild or heavy, may affect the building. Tremors will affect different parts of the structure in different ways. An old building in an earthquake zone has obviously withstood earthquakes of varying magnitude over the years, and is probably sound. Even so, some areas of the house will be more sensitive than others to the effects of earthquake action. It is important to locate these areas, to give them particular attention during routine structural inspections, and to keep their vulnerability in mind when planning exhibits in the building.

Wooden structures should be routinely inspected for insect damage, dry rot, and particularly for water damage. The repeated freezing, thawing, runoff, and freezing in Montana winters is especially hard on building seams and joints (where water may collect and freeze), on unpainted wood, ornamental woodwork, and old masonry work. For damaged or deteriorating woodwork, consider repair and preservation with the new epoxies, polyesters, and other modern synthetic resins as an alternative to their replacement. Such work is complicated, however, and anyone attempting it should consult an expert beforehand. Repairing old mortar is likewise a serious undertaking, and professional advice should be sought before repairs are made. Repairing old masonry with Portland cement is a common, and a damaging error. Being harder than the old brickwork and many types of stones, Portland cement will resist the slight movements in the masonry caused by "settling" or by temperature and humidity changes, causing the bricks or stones to crack or spall under the

pressure. As a general rule, the mortar should be softer than the bricks or stones embedded in it; it will then serve as a cushion for the slight movements that naturally occur in masonry work. In cleaning old masonry, avoid sandblasting; this process removes the hard exterior glaze of the bricks along with the dirt or paint, exposing the weaker porous interior to the weather. Clean masonry only when absolutely necessary, and then with the gentlest method possible, such as low water pressure with soft natural bristle brushes.

Installation of proper lighting and temperature and humidity controls may require major work in a historic building. With lighting, the major concern is usually the condition of existing wiring. It should be brought up to code since unsafe wiring poses a real fire threat to historic buildings. When using kerosene lamps to recreate period lighting, staff should exercise extreme caution because of the danger of fire. When introducing modern heating and cooling systems, as well as new electrical wiring, staff and Trustees should proceed deliberately, and make every effort to preserve the historic appearance and fabric of the building. Your local preservation officer or the Montana State Historic Preservation Office can provide assistance.

Restoration, repair work, or modernization of building facilities involves many technical and historical problems. As the site's most important artifact, the historic building deserves the best and most careful treatment possible. Thorough research and professional advice should precede any work on the building beyond ordinary maintenance.

GENERAL RULES FOR HANDLING ARTIFACTS

1. Limit the amount of handling as much as possible. Do not allow visitors to touch artifacts unless they are specifically designated as "touch and feel" exhibits. Only staff trained in artifact handling should move artifacts.

2. Treat each object with respect, as if it were the most valuable piece in the collection.

3. Think, then act. Consider the object: how should it be handled, what equipment and supplies are needed, how many people are needed for the move? Plan your route: know where the object is going, have that area clean and secure, note any obstacles along the path (doors, stairs, visitors, etc.).

4. Go slowly. Do not hurry: the artifact, not time, is of the essence! Concentrate on what you are doing.

5. Move only one object at a time by hand. If the object is too large or heavy for you to move safely by yourself, ask another person to help. If you must move several small objects, use a basket or cart.

6. Report/record any changes in the condition of an artifact. Report/record damages immediately.

7. Do not allow eating, drinking or smoking near artifacts.

8.Do not use staples, adhesive labels, rubber bands, ball point pens, markers, or adhesive tape (scotch/masking/first aid) in labeling or storing artifacts.

9. Do not undertake any treatment or use any product on an artifact which is not completely reversible, that is, which cannot be undone or removed. A complex or puzzling problem is best left alone until you can contact a conservator for advice.

FURNITURE

Handling

Furniture should be handled with bare hands. The only exception is furniture with a gilt finish, which should be handled with gloves. To prevent denting and scratching of furniture pieces, remove large belt buckles and other jewelry, and empty pockets before carrying pieces from place to place.

Pick up a piece of furniture by its strongest structural parts. For chairs, this means the seat rails. Never pick up a chair by the crest rail, back, or arms. A large armchair, lounge, or sofa will require two people to move it, one on each side or end. Pick up a table by its skirt, not its top. Pick up a chest by its base, not by its top or drawers. (photo 1 & 2)

Remove or secure all loose parts before moving. Drawers should be taken out (top to bottom) and moved separately. All doors should be locked. When moving pieces composed of several sections, such as secretaries, take them apart and move the sections separately, after removing loose finials and cornices. When moving a clock, remove the weights and pendulum. (photo 3)

Avoid contact with upholstery when moving furniture. Pressure on the upholstery, whether leather or textile, will cause it to split and to pull away from the frame. Removable upholstered seats should be removed from furniture before moving.

Photo no. 1

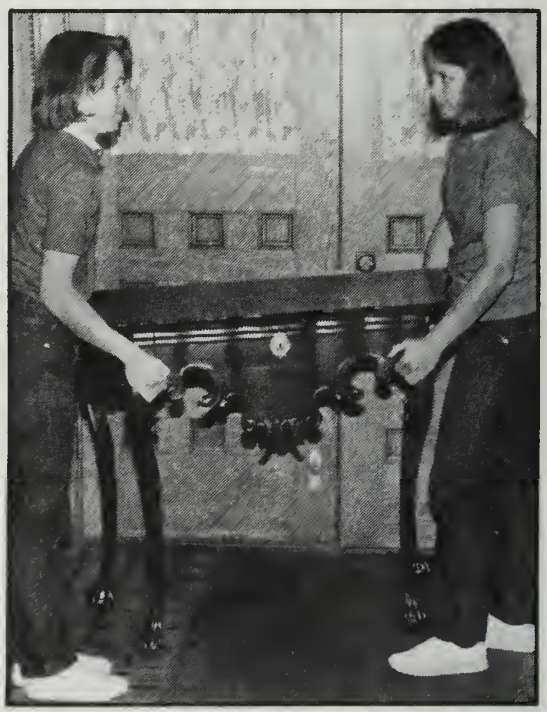

Photo no. 2

Storage and Exhibition

When in storage or on exhibit in a gallery, furniture should be set on a platform to raise it above floor level. This will keep the piece away from wet mops, vacuum cleaners, buffers, or accidental water damage. If on exhibit in a period setting, where the furniture must be set on the floor, cleaning staff should exercise caution with cleaning equipment to avoid bruising the piece. If furniture rests on a carpet or rug from the collection, plastic or glass coasters under the feet can prevent damage to the floor covering.

Furniture should not be stored or exhibited on or in front of heat registers, radiators, air conditioning vents or windows. In period settings, place pieces as far away as possible from heat or cool air sources. *Never* allow direct sunlight to fall upon furniture as it will cause permanent damage. (photo 4)

Care

Most furniture should be dusted with a clean, soft cloth. A soft brush is preferable for pieces with loose veneer, inlay, or paint, or for pieces which are heavily carved. Commercial dusting sprays, liquids, or treated cloths, especially those which contain silicone, are not acceptable for use on museum collections. Use of these products will result in a heavy surface build-up that is difficult to remove. One exception to the rule is Endust, which contains no wax. This should be used sparingly and must be sprayed onto a cloth or brush, not onto the object.

You may wish to use a paste wax containing carnuaba, beeswax, or microcrystalline wax periodically. These waxes will protect the finish

Photo no. 3

Photo no. 4

and reduce fingerprints. Avoid oil and "nourishing" treatments, as they will darken wood and are not reversible.

Place any broken pieces or veneers in a labelled container and store them with the object, making note of the damage in the object's file.

Never place adhesives or adhesive-backed tapes or labels on any furniture surface. If you must use glue to reattach a broken piece, use hide glue, which is reversible.

TEXTILES

Handling

All unnecessary handling of textiles should be avoided. When handling is necessary, do not wear jewelry which could catch or tear a textile. Hands should be clean, dry and lotion free. Wear gloves when appropriate.

All textile items should be handled with both hands, supporting the piece from underneath. Whenever possible, use a lined and covered cardboard box or piece or rigid foam board to move a textile. (photo 5)

Costumes from the collection should *never* be worn for any reason! This practice places undue strain on textiles and exposes them to dirt and stains from perspiration and handling.

To examine textiles, place them on a clean work table covered with a clean, cotton cloth.

Photo no. 5

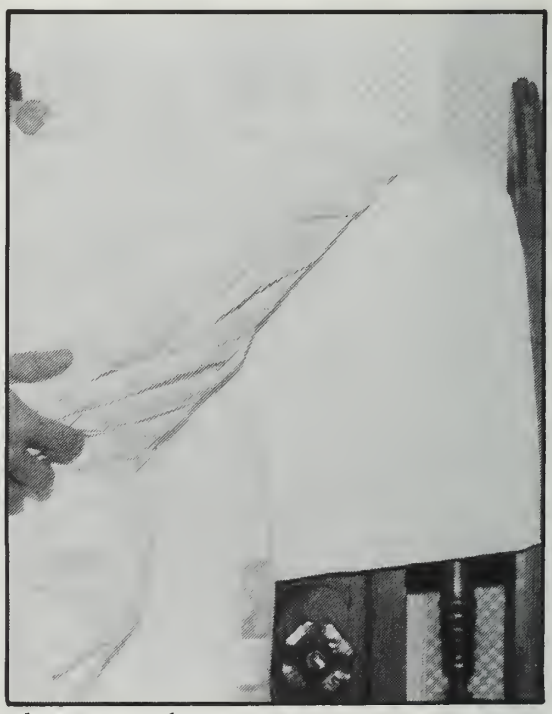

Photo no. 6

Storage and Exhibition

Textiles should never come into contact with acidic materials such as wood, cardboard, newsprint, or any paper of less than 100% rag content. Acid migrating from these sources will stain and weaken textiles. Acid-free tissue paper, and containers lined with polyethylene or microfoam are proper materials for textile storage. Acid, however, is not the only enemy of textiles. Cover textiles at all times, even in storage, to protect them from dust and light.

Keep all metal items — paper clips, staples, pins, shelving — which can rust and stain textiles, away from your collections. If you must use straight pins on a textile, use stainless steel pins.

Textiles on exhibit should not come into direct contact with wood, metal, acidic paper, or painted surfaces. Polyethylene or acid-free tissue makes a good protective barrier. Do not fasten textiles with staples, tacks, non-stainless steel pins, or adhesive tape, and be careful not to expose them to direct sunlight, flourescent light, or heat. (photo 6)

Textiles on exhibition should be changed every three to six months: three months in a gallery where the exhibition is open daily for eight hours or more; up to six months in a historic house open for a half a day, several days a week.

Large, flat textiles, such as quilts, tablecloths, or rugs, may be rolled on acid-free tubes and stored on racks. Cardboard carpeting tubes or PVC plastic pipe covered with polyethylene can serve the same purpose as acid-free tubes, and they are cheaper. Each rolled textile may be covered with polyethylene and loosely tied with cotton or linen twill tape, or the entire rack can be covered. If the textile is to go on exhibit, sew a muslin sleeve to its back to receive a hanging support. (photo 7)

Costumes in sound condition can be hung on specially padded hangers covered with unbleached muslin. Heavy dresses may require loops of cotton tape sewn into the waistband and secured to the hanger for additional support. For exhibition purposes, consider mounting costumes on a custom-cut form of foam board covered with acid-free tissue or unbleached muslin, or a stuffed form or manniquin similarly covered. Carefully mend weak seams, holes, and tears in an easily reversible manner before exhibition.

Small textiles and delicate costumes are best stored and exhibited on a flat surface. If they must be folded, pad the creases with acid-free tissue and rearrange and refold the piece periodically to even the stress. Padding also helps shoes and hats preserve their shapes. Do not exhibit or store other objects on top of a textile.

Remember to keep carpets and rugs from the collection out of public pathways. Staff should walk on them only when necessary and should not wear heavy boots or high heels when doing so. Pads should be put under carpets or rugs. Stanchions and runners can help control traffic, keeping visitors well away from all collections, and off your rugs and carpets. (photo 8)

Care

Textiles should never be washed in a washing machine, bleached or starched. Woolens should never be ironed.

You may remove surface dust by gently shaking or, preferably, by vacuuming. A small hand vacuum will do an effective job when a nylon or fiberglass screen is placed over the area to be cleaned. The screen will prevent the vacuum from pulling up any loose threads, torn areas, or surface decoration. Two cautions when vacuuming: cover the edges of the screen with cloth tape to prevent snagging and never apply too much pressure with the vacuum nozzle. This procedure is also acceptable for textile upholstery.

Vacuum carpets with a canister unit, using a flat brush and moving in the direction of the pile. Before storing, vacuum the back of the carpet. If a carpet requires cleaning, consult with a conservator or a firm that specializes in such work.

Consider wet cleaning of textiles only if it will not affect the appearance, strength, or color of the fabric. Some woolens, cottons, and linens are hand-washable (remember to test first for color-fastness) in warm water with a conservation detergent such as Orvus. When hand-

Photo no. 7

Photo no. 8

washing, the piece should be supported on a fiberglass screen and gently sponged to release the dirt. After a thorough rinse (and still on support), pat them dry with cotton towelling or mattress pads, and allow to air-dry out of direct sunlight.

If mending is required, use a fine needle and thread of the same type material (cotton for cotton material, silk for silk, etc.) as the piece to be mended. Sew stitches so that they can be easily removed. Silk crepeline may be sewn onto a weak area for support. When attaching registration numbers, type them onto a cotton tape label and sew them into the piece. Never mark a number directly on a textile.

Many nineteenth-century silks were processed with salts that are now causing the fabrics to shred. There is no treatment available for these items, though a crepeline covering may help preserve the appearance.

ARTWORK

Handling

Works of art on paper, if unframed, should be handled in the same manner as textiles. Carry framed artwork with two hands, one supporting the bottom of the piece and the other gripping the side or top. Wear gloves when handling gilt frames. When lifting or carrying unframed oil paintings, grasp by the outer sides. If the artwork is too large for one person to handle safely, two people should move it. (photo 9)

Photo no. 9

Photo no. 10

The painted surface should face you when you carry a painting. If you must set a painting down, place it on padded blocks, tilted at a slight angle against a wall with the painted surface facing out. If framed artwork must be stacked against a wall, it should be for as briefly as possible and the painted surfaces should face each other to prevent hangers or wires from scratching the artwork. (photo 10)

Do not carry painting up and down a ladder. One person should climb the ladder, and have another person hand the painting up to them.

Storage and Exhibition

Unframed works of art on paper should be stored flat in lined drawers and interleaved with acid-free tissue.

Sliding racks are a space-saving method for storing works of art. Mirror hangers or D-hooks, attached to the frame rather than the painting's stretchers, is the most secure hanging system. Avoid screw eyes; they loosen over time and leave large holes in the frame. When exhibiting artwork, it is preferable to mount pieces on two hooks on the wall - one for each side of the piece, rather than to use wire and one central hook. Some historic houses have picture molding, from which artwork may be hung with cords or wire attached to molded clips.

Unframed works of art with stretchers can be stored upright in bins, using sheets of corrugated cardboard (larger than the piece) to separate them. Cushion the bottom of the bin with indoor-outdoor carpeting. Avoid the rubber-backed variety, since both the rubber and the adhesive which bonds it to the carpet can decompose, and the debris can come into contact with the artwork.

A painting with a flaking surface should be stored flat, face upward, until it can be treated by a conservator.

Never hang works of art directly over or in front of a hot or cool air source, or in direct sun or under fluorescent lights.

Care

Paintings should be examined periodically with a flashlight held at a raking angle to check for flaking and lost paint.

Dust frames occasionally with a clean, soft cloth. Gilt or heavily carved frames will require the use of a soft brush. Feather dusters are, in all cases, *not* appropriate.

To clean glass in frames, spray glass cleaner (use cleaner without ammonia) onto the cleaning cloth to be used, not onto the glass itself. Excess cleaner could run down into the frame and stain the artwork.

All framing materials in direct contact with a work of art on paper or a

photograph should be acid-free. Use thin strips of acid-free matboard or an acid-free mat to keep works of art on paper or photographs from contact with the glass in the frame.

Never touch the surface of an artwork.

METALS

Handling

Wear gloves when handling any metal object, from gold to tin. Cotton gloves, available from photography supply shops, are necessary, because salts, acids, and other excretions from the hand's sweat glands can corrode and etch metal surfaces. For the same reasons do not allow perspiration to fall onto a metal object. (photo 11)

As with other types of objects, handle metal artifacts individually with both gloved hands, avoiding all spouts, knobs, or handles. Several metal objects can be moved together in a basket or on a cart if padded and protected from each other. Metals are surprisingly soft and some, such as tin and silver, are easily scratched and dented. Many metals can and will break if dropped. (photo 12)

Storage and Exhibition

Storage shelves for metals should be padded. Packing or storage materials used should be chemically inert, such as microfoam or polyethylene. Do not use polyurethane or foam rubber, which are not inert and will corrode metal. Silver can be stored in pacific cloth bags

Photo no. 11

Photo no. 12

or wrapped in acid-free tissue and placed in polyethylene bags. For silver exhibited in cases, you may wish to use tarnish-inhibiting paper strips. These strips should not be placed in or against a piece and they should be changed regularly.

Separate stacked metal objects in storage or on exhibit with polyethylene sheets or thin layers of microfoam. If a metal object is exhibited on another actifact, you can prevent scratching by placing a piece of polyethylene between the objects.

Keep lead objects away from acidic materials such as cardboard or wood, which can cause them to corrode. Keep all foodstuffs, liquids, flowers and plants from direct contact with a metal artifact, as they too will cause corrosion.

Care

Metal objects should be dusted with a clean soft cloth. If dirty, wash them in plastic tubs with a mild detergent, then thoroughly rinse and dry them.

Most commercial metal polishes contain ammonia, which is corrosive. Low-ammonia polishes, such as Twinkle Silver Cream or 3M Tarnishield, are the best products to use on silver and tin: Golden Glow is preferable for brass and copper, but the supplier has recently discontinued this product. Consult an expert for a comparable product available in your area. After using the polish, wash the object in a plastic tub with a mild detergent to remove *all* polish residue. Then rinse and dry thoroughly. Use cotton swabs or soft toothbrushes to polish and remove residue in areas that are difficult to reach. Since cotton gloves can be uncomfortable and difficult to work with during cleaning, plastic surgical gloves may be substituted.

Rust may be removed from iron by using very fine (000 or 0000) steel wool. To inhibit corrosion, coat iron and other metals with carnauba wax or a microcrystalline wax.

CERAMICS AND GLASS

Handling

All ceramic and glass artifacts should be handled with clean, dry hands. Never wear gloves, jewelry (which could scratch or chip), or long, loose sleeves (which could catch on an artifact).

Pick up, carry, and set down one piece at a time, using both hands to support it. Remove all detachable sections, such as lids, before mov-

ing. Never pick up an object by a handle, spout, rim, or knob, as these areas are the weakest structurally and may have been repaired previously. Objects on high shelves should be moved by two people; one on a ladder handing the object to the other on the floor.

When moving several small ceramic or glass items, pack them into a basket, separating them by tissue paper, microfoam, or cloth. You may also use a cart with a padded surface, but first check to make sure you will not have to roll the cart over a rough floor surface (such as flagstone) when moving the artifacts from one place to the other.

Storage and Exhibition

Ceramics and glass can be stored on shelves that have been padded with microfoam (though not so heavily padded that the artifacts cannot be balanced). If pieces must be stacked, either in storage or when on exhibit, they should be separated by polyethylene or on a thin sheet of microfoam - and keep the stack small.

Ceramics and glass should not be supported by metal or wire stands when on exhibit. Metal can stain, scratch, or chip glass. Plexiglas stands work well for exhibits while polyethylene placed over the metal will provide a suitable storage shelf.

Ceramics and glass, especially colored glass, should be kept away from the heat of incandescent or spot lighting.

Earthenware objects should not have any liquids put in them; this can cause them to lose their glazing and crumble.

Care

Glazed ceramic and glass artifacts which are not hand-painted can be washed safely in plastic tubs. Washwater should be lukewarm, never hot. Fill a tub with water and a mild detergent such as Ivory liquid for washing. Do not use cleansers or bleaches. Fill another tub with water for rinsing; when washing glass, add a small amount of ammonia to the rinse water. A flat, padded surface provides a safe work space for setting out, washing and drying the pieces. Dry narrow-necked objects by using a long wick of paper toweling to absorb moisture.

Never apply adhesives or adhesive-backed tapes or labels to ceramics or glass.

If you break a ceramic or glass artifact, pick up the pieces one by one, and store them individually wrapped or separated in a compartmentalized, soft container such as an egg carton. Sweeping the pieces together or storing them together can cause the fragments to chip and make a close fit more difficult during repair.

THE HISTORIC BUILDING

As noted above, the building itself is an historic house museum's most important artifact, and the overall conservation plan should include provisions for care of the building and its important features. The plan should provide for the maintenance of the grounds surrounding the house as well: outbuildings, fences, hedges, garden plots, flower beds, and other features can be important evidence in reconstructing the history of the site. On the building itself, important architectural features such as porches, cupolas, staircases, and "gingerbread" ornament, should be carefully preserved. These should not be removed unless thorough research has demonstrated that the feature is a late addition, inappropriate to the period selected for interpretation and an intrusion upon the interpretation. Inside or outside the building, remodeling should be done only as a part of a carefully planned program of restoration. Sometimes it may prove necessary or desirable to remove recent additions to the house in order to carry out an interpretive plan. In other cases, staff and trustees may decide that the succession of additions to a building is an important part of its history, and the newer features should remain in place to show the changing use of the building or changing ideas of good design.

To a great extent, the preceding suggestions for the care of collections also apply to the building's interior features. Caring for woodwork, for example, involves many of the same problems and solutions as the care of furniture. The same rules that apply to the care of metal, ceramic, or glass objects in the collections apply as well to the building's light fixtures made from these materials. Fabric wall coverings may often be treated in the same manner as upholstery. Other areas of the house present special problems, however. In restoring wooden floors, the familiar sanding machine can work disaster, especially on soft woods. If stripping is absolutely necessary, it should be done with paint or varnish remover and hand sanding in tough spots. After stripping, scrub the floor several times with mild lye-water to remove the chemicals (the water should be used sparingly, never allowed to stand in pools on the wood). If strong protection is needed, a clear, flat sealer can be applied. For better protection of areas that bear heavy traffic, however, lay a path of protective matting. On floors of parquet or other relatively delicate material, a path of mats provides very important protection from the visitor traffic while it directs visitors through the exhibits along a regular route.

Walls with stained, bubbled, or peeled wallpaper or paint suggest a

serious problem. An expert should be consulted in this situation: the wall damage is probably a symptom of a larger problem which must be corrected before the wall can be repaired. Before repainting or removing any wall covering, be certain that the work is really necessary and that an original wall treatment or a rare and valuable wall covering is not destroyed in the process. As with artifacts, wall coverings should be cleaned only when absolutely necessary, and then only after careful research has determined the composition of the wall material, the nature of the problem, and the cleaner best suited to the problem. In general, the gentlest cleaning method available is the best.

Each type of artifact has its own special requirements for care and conservation. One general rule, however, applies in all cases: Think before acting, and be very certain that the treatment will achieve the desired effect. Objects can be damaged as seriously by inappropriate treatments as by simple neglect. Once you identify a problem, consider all possible solutions and select the most appropriate. A large and growing body of literature on conservation practices can provide valuable help in such decisions, and professional advice is often available at no charge. In seeking help on problems of collections care in historic buildings, the best places to begin in Montana are the State Historic Preservation Office, the Montana Historical Society Museum Program, and the Rocky Mountain Regional Conservation Center. The care and conservation of historic houses and their collections can be an exciting and rewarding task. When properly conducted, the work will contribute to the education and enjoyment of visitors to the historic site for generations to come.

PART III:

PRODUCTS

Products	*Sources*
Dehumidifier	local hardware store
UV light filters	plastic and plexiglas suppliers
hygrometers, hygrothermographs	scientific instruments suppliers
microfoam	paper distributor
baskets	local store
plastic tubs	local store
white cotton gloves	Kodak CAT. 187 7711, photography supply store
latex surgical gloves	conservation supplier, medical supplier
polyethylene bags (Glad, Ziploc)	local store
polyethylene sheet (visquine)	local store
Endust	local store
carnauba wax (Trewax, Johnson's Paste Wax, Butcher's Bowling Alley Wax)	local store
microcrystalline wax (Renaissance Wax)	conservation supplier
silver polish (Twinkle, 3M Tarnishield)	local store
tarnish-inhibiting strips	local jewelry store
acid-free papers, boxes, tubes	conservation supplier
sheets, blankets, towels	volunteers, members
Orvus detergent	conservation supplier
crepeline	conservation supplier, fabric shop
softest camel hair brush (Grumbacher 3361); softest badger brush (Winsor and Newton 456)	art supply store
carpeting tubes	local carpet store

Products, continued

PVC piping	local hardware or building supply store
nylon or fiberglass screening	local hardware store
stainless steel pins	conservation, taxidermy, or scientific supplier
hand vacuum (Dustbuster)	local store
padded bars (2x4 section, indoor/outdoor carpet)	made by staff; materials from local store
hide glue	conservation supplier, hardware store

SUPPLIERS

Hygrothermographs / Psychrometers

Weathertronics
P.O. Box 41039
Sacramento, CA 95841

Conservation Materials
240 Freeport Boulevard
Box 2884
Sparks, NV 89431

Dickson Co.
930 S. Westward Drive
Addison, IL 60101

Abbedon Cal, Inc.
123-817F Gray Avenue
Santa Barbara, CA 93101

Belfort Instrument Co.
727 S. Wolfe Street
Baltimore, MD 21231

Science Associates
31 Airpark Road
Box 230-12
Princeton, NJ 08542

Fisher Scientific Company
1241 Ambassador Boulevard
P.O. Box 12405
St. Louis, MO 63132

Ultra Violet Filters

Solar Screen Company
5311 105th Street
Corona, NY 11368

3M Company
3M Center
St. Paul, MN 55101

Verilux, Inc.
35 Mason Street
Greenwich, CN 06830

West Lake Plastic Company
West Lenni Rd
Lenni Mills, PA 19052

Advanced Plastics
3565 Dickerson Road
Nashville, TN 37207

Commercial Plastics
2340 SW Temple
Salt Lake City, UT 84115

and local glass shop

Acid-free materials/General Supplies

Light Impressions Corporation
Box 3012
Rochester, NY 14614
(716) 271-8960

Process Materials
301 Veterans Boulevard
Rutherfor, NJ 07070
(201) 935-2900

Gaylord Brothers, Inc.
Box 8489
Stockton, CA 95208
(209) 446-2576

Hollinger Corporation
P.O. Box 6185
3810 S. Four Mile Run Drive
Arlington, VA 22206
(703) 671-6600

University Products, Inc.
P.O. Box 101
South Canal Street
Holyoke, MA 01040
(413) 532-4277

Conservation Materials Ltd.
Box 2884
340 Freeport Boulevard
Sparks, NV 89431
(702) 331-0582

Pacific Cloth/Tarnish Inhibitors

Pacific Mills
1430 Broadway
New York, NY 10018

3M Company
3M Center
St. Paul, MN 55101

local jewelry/fabric store

Silica Gel

Schoof's Inc.
P.O. Box 67
Moranga, CA 94556
(800) 227-1345

Twill Tape/unbleached, unsized muslin/cotton batting

Newark Dressmaker Supply
P.O. Box 2448
Lehigh Valley, PA 18001

TALAS
Division of
Technical Library Service
130 Fifth Avenue
New York, NY 10011

Testfabrics, Inc.
P.O. Box 0
Middlesex, NJ 18846

Cerulean Blue, Ltd.
119 Blanchard Street
P.O. Box 21168
Seattle, WA 98111-3168

order through local fabric store

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